

Shaw, R.L., Holland, C., Pattison, H.M. & Cooke, R. (2016). Patients' perceptions & experiences of cardiovascular disease & diabetes prevention programmes: a systematic review & framework synthesis using the Theoretical Domains Framework. *Social Science & Medicine*, 156, 192-203. DOI: 10.1016/j.socscimed.2016.03.015

Patients' perceptions and experiences of cardiovascular disease and diabetes prevention programmes: a systematic review and framework synthesis using the Theoretical Domains Framework

Background: This review provides a worked example of 'best fit' framework synthesis using the Theoretical Domains Framework (TDF) of health psychology theories as an a priori framework in the synthesis of qualitative evidence. Framework synthesis works best with 'policy urgent' questions. **Objective:** The review question selected was: what are patients' experiences of prevention programmes for cardiovascular disease (CVD) and diabetes? The significance of these conditions is clear: CVD claims more deaths worldwide than any other; diabetes is a risk factor for CVD and leading cause of death. **Method:** A systematic review and framework synthesis were conducted. This novel method for synthesizing qualitative evidence aims to make health psychology theory accessible to implementation science and advance the application of qualitative research findings in evidence-based healthcare. **Results:** Findings from 14 original studies were coded deductively into the TDF and subsequently an inductive thematic analysis was conducted. Synthesized findings produced six themes relating to: knowledge, beliefs, cues to (in)action, social influences, role and identity, and context. A conceptual model was generated illustrating combinations of factors that produce cues to (in)action. This model demonstrated interrelationships between individual (beliefs and knowledge) and societal (social influences, role and identity, context) factors. **Conclusion:** Several intervention points were highlighted where factors could be manipulated to produce favourable cues to action. However, a lack of transparency of behavioural components of published interventions needs to be corrected and further evaluations of acceptability in relation to patient experience are required. Further work is needed to test the comprehensiveness of the TDF as an a priori framework for 'policy urgent' questions using 'best fit' framework synthesis.

Keywords

Cardiovascular diseases; diabetes; health check; behaviour change intervention; theoretical domains framework

Introduction

Substantial advances in methodology for reviewing and synthesizing qualitative evidence have been made (e.g. Pope, Mays & Popay, 2007; Shaw, 2010) and clear arguments exist for including non-trial, context-sensitive evidence within reviews of effectiveness; this offers a route for patient perspectives to be incorporated into good practice guidance if methods for qualitative evidence synthesis are taken up (Kelly, Stewart, Morgan et al., 2009; Shaw, Larkin & Flowers, 2014; SIGN, 2011). However, qualitative evidence synthesis can be labour intensive and requires a high level of expertise in qualitative methodology. The recent development of 'best fit' framework synthesis (Carroll, Booth & Cooper, 2011; Carroll, Booth, Leaviss & Rick, 2013) offers an alternative systematic methodology based on framework analysis (Ritchie & Spencer, 1994). It adopts an a priori theoretical framework to guide data extraction and synthesis making it more efficient and accessible as an approach for reviewing and synthesizing 'policy-urgent' questions without sacrificing theory.

This paper offers a novel application of framework synthesis using the Theoretical Domains Framework (TDF; Cane, O'Conner & Michie, 2012; Michie, Johnson, Abraham et al., 2005). The TDF was chosen as the theoretical framework for this review because it was developed following a systematic review and synthesis of health psychology theories (Michie et al., 2005), thus completing the initial step in 'best fit' framework synthesis (Booth & Carroll, 2015). The review identified 14 theoretical domains and 84 component constructs (Michie et al., 2005). These were then validated (Cane et al., 2012) and have been used to explain implementation problems, to develop theory-informed behaviour change interventions, and to assess which theoretical domains are relevant to particular interventions (e.g. French et al., 2012; Francis, Stockton, Eccles et al., 2009; McKenzie, O'Connor, Page et al., 2010). Using the TDF as an a priori framework to guide the synthesis enabled insights from a wider range of

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theoretical constructs than using one theory alone. This is the first review of which we are aware that brings together the TDF with 'best fit' framework synthesis to offer a rigorous and theoretically informed method for synthesizing qualitative research studies.

The 'policy urgent' review question selected was: what are patients' experiences of prevention programmes for cardiovascular disease (CVD) and diabetes? These conditions were selected because they feature in many public health programmes around the world (see for example: Holland, Cooper, Shaw, Pattison & Cooke, 2013). One reason for both conditions being the focus of prevention programmes is that they are related. CVD, including coronary heart disease and stroke, account for more deaths globally than any other diseases (WHO, 2011a); in 2008, 30% of deaths worldwide were attributed to CVD (WHO, 2011b). Diabetes is a risk factor for CVD and the World Health Organisation (WHO) predicts diabetes will be the seventh leading cause of death globally by 2030 (WHO, 2011a). Furthermore the incidence of type 2 diabetes mellitus globally is rising, specifically in younger age groups (Alberti, Zimmet, Shaw, Bloomgarden, Kaufman & Silink, 2004). Lifestyle changes can reduce the risk and prevent further complications of CVD and diabetes and evidence suggests that early detection may lead to better health outcomes (NICE, 2010; WHO, 1999).

Previous reviews of prevention programmes have considered reduction in risk measurements and cost-effectiveness or years of life added as outcomes (Ebrahim, Taylor, Ward et al., 2011) but have not considered behavioural aspects. A recent review by Holland et al. (2013) focused on behaviour change elements within coronary heart disease (CHD) and diabetes prevention programmes and revealed mixed benefits. They found that feedback regarding risk level, an evidence-based behaviour change technique (Michie, Ashford, Sniehotta et al., 2011), prompts successful behaviour change (e.g. Robertson, Phillips & Mant, 1992). Furthermore, those at higher risk have been shown to be more likely to change their behaviour following dialogue

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(Craigie, Barton, Macleod et al., 2011; Koelewijn-van Loo, van der Weijden, Ronda et al., 2010). Nevertheless, despite ongoing research in the field, it is not clear why prevention programmes do not have more reliable effects on behaviour change. A review of patient perspectives and experiences of such programmes may help to answer this question.

Method

This review adopted systematic review methodology following PRISMA guidance (Moher, Liberati, Tetzlaff & Altman, 2009) and followed the step-by-step procedure for 'best fit' framework synthesis (Booth & Carroll, 2015).

Study inclusion criteria and search strategy

Inclusion criteria: qualitative research studies reporting evaluations of existing early detection or prevention or screening programmes for CVD or diabetes; in primary care or in the community; for adults; including patients' perspectives; using qualitative methods; since 1990; in English. Search terms were adapted from Holland et al. (2013) and included the qualitative methods filter (qualitative, findings, interview*; Grant, 2004) identified as an efficient method for identifying qualitative research (within the restraints of limited subject headings in bibliographic databases for qualitative methods; Shaw, Booth, Sutton et al., 2004). Web of Knowledge and PubMed were searched and reference chaining of relevant studies conducted. The full search strategy is included in Additional File 1.

Quality assessment of studies

Studies were appraised using prompts (Dixon-Woods, Shaw, Agarwal & Smith, 2004) devised specifically to determine the quality of qualitative research which focus on transparency, a key indicator of trustworthiness (Carroll, Booth & Lloyd-Jones, 2012; Lincoln & Guba, 1985). A rating system, adapted from Dixon-Woods, Sutton, Shaw et al. (2007), was then used to

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categorise original studies. In the revised system only studies to be included were appraised; no studies were excluded on grounds of quality.

Data extraction and synthesis

Data were extracted from the results sections of included studies directly into the a priori framework, i.e. the TDF, using a deductive process. This included themes or categories of findings presented by authors, primary data extracts, and author commentary about those data. Subsequently, an inductive (data-driven) thematic analysis (Braun & Clarke, 2006) was conducted in order to code any data that did not fit into the TDF to ensure nothing was missed. Concepts from the TDF and inductive thematic analysis were then clustered and synthesized into a final set of themes representing the whole dataset. This involved interpretative work to identify relationships between themes and mediating factors between individual-societal-organisational based aspects within them. All stages of analysis were discussed within the review team until consensus was reached.

Sensitivity analysis

It has been argued that the transparency of reporting of qualitative studies is crucial to their utility in secondary analysis (Carroll et al., 2012). 'Thin' descriptions of people's views, with inadequately reported research questions or methods, cannot be relied upon and so the strength of secondary analyses rests on the quality of included studies (Harden, Garcia, Oliver et al., 2004). A sensitivity analysis (Carroll et al., 2012) was conducted with and without the poorer quality studies to determine the impact on coding against the TDF and the generation of inductive themes. Further analysis was conducted to examine whether the presence/absence of (a) the theoretical domains from the TDF and (b) the inductively generated themes affected the

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final set of themes and conceptual model in order to ensure the synthesis of findings was not skewed in favour of either the TDF or the inductive thematic analysis.

Results

Included studies

Following removal of duplicates 585 potentially relevant records were identified. These were screened at title and abstract level to leave 50 studies to be assessed for eligibility. After further exclusions against inclusion criteria 42 studies were excluded, leaving eight included studies. Reference chaining identified six additional studies, resulting in 14 studies judged relevant for inclusion (see Figure 1 for PRISMA flow diagram). Full details of studies are available in Table 1. Six studies were conducted in the UK, three studies reported findings from one Danish study, two were based in the US, one in Australia, one in Sweden, and one in Thailand. Six studies described prevention programmes for diabetes and pre-diabetes; five of which involved prevention programmes for CVD. Two studies focused on the UK National Health Service (NHS) Health Check, a prevention programme targeting cardiovascular disease, diabetes, stroke and kidney disease; one focused on CHD and the other on CHD risk. Four studies collected data from healthcare professionals as well as patients; the remaining ten included patients only. Individual interviews were the dominant method of data collection (n=12) with some using focus groups (n=3) and one study used both; analysis methods included Content Analysis (n=1), Framework Analysis (n=3), Grounded Theory (n=2), Interpretative Phenomenological Analysis (n=1), Thematic Analysis (n=5) and two were unstated.

[insert Table 1 near here]

Quality of included studies

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Studies were appraised and rated independently by the first and last author. Any differences were discussed in full, and a rating agreed (see Table 2 for ratings). Overall, study quality was good with good levels of transparency and detailed discussion of data included. Using an adaptation of Dixon-Woods et al. (2007), *key papers* were those which fitted the review question and met all quality criteria; *satisfactory* studies fitted the review question and met most criteria. Studies categorised as *unsure* did not meet all the quality criteria and were treated cautiously because we were unsure about their trustworthiness. Studies rated *poor* did not include sufficient data extracts to judge whether conclusions were evidenced and some omitted their method of analysis.

Sensitivity analyses

Sensitivity analyses confirmed that no final theme was reliant on a single original study and excluding those of rated unsure did not affect the results; they acted to support higher quality studies which reported 'thick descriptions' (Geertz, 1973) of findings. None of the studies rated unsure was represented in the inductive thematic analysis because of the lack of data included. One theme (Cue to (in)action; see below) was generated largely from the inductive analysis alone but others were representative of both.

Findings from included studies supported the theoretical constructs included in the TDF which demonstrated the utility of the framework (see Table 3 for full descriptions of theoretical domains and constructs in the TDF and in which studies they were identified). However, some elements of original findings were not addressed in the TDF which meant additional themes were identified in the inductive thematic analysis. Furthermore, some original studies cited theories *not* in the TDF, suggesting further development of the framework may be necessary: the Common Sense Model of Illness Representations (Leventhal, Nerenz, Steele, Taylor & Singer, 1984) and the Health Promotion Model (Pender, 1996) (see Table 4 for additional

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theoretical constructs and in which studies they were identified). Related to illness representations, the thematic analysis highlighted the physiological signs of illness which were related to people's confidence in their (in)ability to identify CVD or diabetes through their bodily sensory perceptions, i.e., their impact on self-efficacy (Bandura, 1977). Self-efficacy is described in the TDF as beliefs about an individual's self-confidence, perceived behavioural control and empowerment regarding behaviour.

Framework synthesis

Below, the final set of themes is presented followed by a summary of the conceptual model.

Knowledge

This theme represents what is often considered the starting point for behaviour change; knowing what the prevention programme entails and why it is important to reduce risk for CVD and diabetes. Original studies reported a range of knowledge levels in their patients and one paper reported low levels of knowledge among healthcare professionals (Sranachoenpong & Hanning, 2011).

In general, there was a lack of awareness of prevention programmes for CVD and diabetes prior to being invited to attend one (Burgess, Wright, Forster et al., 2014; Chipchase, Waterall & Hill, 2013; Harkins, Shaw, Gillies, Sloan et al., 2010). However, a common conceptualisation of prevention programmes once they have been introduced is that they are like a general health check.

My perception of reading through things was that it was going to be a good overhaul. You know, overall body check for everything, so I don't think it was as in-depth as I thought it was going to be. (Rachel; participant; Chipchase et al., 2014, p.24)

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Although perceived as a *general* health check there was an expectation that the tests would be tailored to individuals.

I thought it was more particular to me, you know trying to sort out just how bad I was whatever, didn't realise it was a separate little screening as opposed to just for myself.

(Patient 43; participant; Goyder, Carlisle, Lawton & Peters, 2009, p. 88)

That the programme was a public health intervention aimed at the whole population seemed to undermine patients' perceptions of its importance to them as individuals; "a separate little screening". Not knowing what the tests involved was also likely to dissuade patients from attending.

Lack of awareness emerged as a general theme across both those who accepted and those who declined the health check. It may be that lack of clarity and understanding of what the health check involved had discouraged attendance. (authors; Burgess et al., 2014, p. 4)

I didn't know what it was about, I didn't know if they'd have me on a treadmill or anything like that and I wasn't wanting that. (Respondent 1, Group 1; participant; Harkins et al., 2010, p. 5)

As well as indicating limited knowledge about the tests themselves, included studies revealed poor knowledge about CVD and diabetes (Goyder et al., 2009; Harkins et al., 2010; Lanza, Albright, Zucker & Martin, 2004; Sranacharoenpong & Hanning, 2011; Williams, Mason & Wold, 2001). Some participants perceived screening as an opportunity to provide information and thereby improve knowledge about risk factors and disease prevention among patients (Goyder et al., 2009) and healthcare staff (Sranacharoenpong & Hanning, 2011).

Beliefs

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This theme demonstrates the complexity of beliefs and how they play out in people's perceptions of lifestyle related diseases, risks and their own capacity to make lifestyle changes. The original studies revealed a range of beliefs about different aspects of prevention programmes which sometimes interacted with knowledge levels. Sometimes beliefs can change with increased knowledge; equally, one's knowledge may be stunted by a belief that acts as a barrier to information provision. Sometimes this meant that patients did not believe test results which indicated an elevated risk.

I don't know what they found to make them think I am at risk in the future...what would make them believe that I will develop diabetes. I don't know why. (N13; participant; Troughton, Jarvis, Skinner et al., 2008, p. 90)

Others actively avoided obtaining new knowledge specific to their own risk in response to their belief that getting high risk results from the tests would elicit negative feelings, something to be avoided.

Negative beliefs about the consequences of having a health check included potentially being given bad news or being 'told off'. Non-attendance was sometimes linked to a belief that it might be better not to know that one might have an undiagnosed condition or be at risk of developing one. (authors; Burgess et al., 2014, p. 8)

Patients' beliefs about capabilities were cited in relation to their perceived ability to make lifestyle changes if they were found to be at risk of CVD or diabetes. These reflected internal beliefs about their "self-motivation and self-concept" and were split into negative beliefs about themselves, e.g. "lack of self-discipline" and "no willpower to exercise" and positive beliefs about themselves being "able to do more" and "looking better" as a result of beginning to make lifestyle changes which encouraged them to continue (Ray, 2001). The link to self-efficacy is

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clear; one needs to feel able to make a change and be encouraged by initial steps toward change for it to be initiated.

Some beliefs acted as barriers to prevention programmes. One was a belief in a connection between the mind and illness (Nielsen, Dyhr, Lauritzen & Malterud, 2009). For the patient in this study a prevention programme was not necessary because she believed that a strong and positive mind would protect her against lifestyle related conditions. For her, this rationalised abstinence from the prevention programme and any health behaviour change.

[Patients] discussed the mind as a powerful tool to maintain good health. The mind can make you ill, cure you, keep you well or kill you. A woman stated that someone who feels well, is not so likely to catch a disease. It is important to avoid stress and be positive. This makes you stronger and gives you a chance of a better and longer life.

(authors; Nielsen et al., 2004, p. 30)

A second belief that acted as a barrier to prevention programmes was a national sense of pride in health that was closely associated to perceptions of citizenship. In the Danish studies, being a good citizen was linked to the ability to work and poor health perceived as a weakness which would bring into question one's ability to work. Thus, accessing healthcare services was perceived as a weakness which would prohibit participation in prevention programmes.

The traditional strong connection between health and work influenced both attitudes and feelings. One informant described her mother saying; "She never complained, even if she was in pain. She struggled for a long time and was extremely enduring and I am proud of that". This *pride* in being strong was still there today. (authors and participant; Emmelin, Weinhall, Stenlund, Wall & Dahlgren, 2007, p. 8)

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Although the authors observed a change among the younger generation, the legacy of this underlying societal belief of illness as a weakness remained a powerful influence. This is an example of how societal beliefs can impact on individuals' decision-making and readiness to engage in prevention programmes.

Cue to (in)action

The focus of the prevention programmes in the included studies was twofold: to identify risk levels; and to foster positive health behaviour change and thereby prevent the risk of CVD or diabetes from increasing further. The first part was reported in terms of CVD risk scores or the detection of pre-diabetes; the second part was not always clearly described but involved advice about nutrition, physical activity, and smoking cessation. This theme demonstrates that sometimes the prevention programme was perceived as a cue to action, i.e. to make lifestyle changes, but sometimes it was perceived as reinforcement of good health which did not require action. In the Danish Ebeltoft Project (reported in: Nielsen et al., 2009; Nielsen, Dyhr, Lauritzen & Malterud, 2005; Nielsen, Dyhr, Lauritzen & Malterud, 2004) it was clear that patients' beliefs that they were in good health had been confirmed following a test result which indicated a low or medium risk profile.

The screening confirmed the participants' feeling of being in good health and they put emphasis on this acquired peace of mind. Participants used the results to eliminate worries and confirm their lifestyle up to now [...] though others remarked on the risk of becoming over-complacent. (authors; Nielsen et al., 2009, p.113-4)

That this reinforcement of good health acted as a cue to inaction reveals a belief that preventative action, i.e. changes in lifestyle, was only necessary if risk was already elevated. This belief undermines the essence of prevention programmes; preventative action can always

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be taken even in the absence of risk. There was an awareness of this however in the concern about over-complacency; clearly some participants were aware that their risk profile may change over time and that taking preventative action may be required further down the line. Of greater concern, was that the same kind of reaction was observed by those in higher risk categories (Nielsen et al., 2005). If an elevated CVD risk score was identified but other tests proved normal (e.g. lung capacity), those normal results tended to overshadow the fact that they were a member of a high risk group.

It was great to get the “all-clear” on a whole lot of things I’d been wondering about. I wasn’t in quite such bad shape as I’d thought. (J3-1; participant; Nielsen et al., 2005, p. 236)

These findings demonstrate a tendency toward unrealistic optimism which cued patients toward inaction. Further consolidation of this perceived confirmation of good health came from patients' fundamental belief that illness was always symptomatic (Burgess et al., 2014; Harkins et al., 2010).

I just didn’t feel I needed it (screening) I just didn’t feel...ill. (Respondent 4, Group 2; participant; Harkins et al., 2010, p. 5)

There was a clear belief that signs of CVD or diabetes would be felt in the body as symptoms; this expectation to feel the illness or to feel it coming was found to influence participants' perceptions of whether they were at risk and their decisions about the necessity of lifestyle change. Thus, the lack of embodied symptoms was often perceived as a cue to inaction (Burgess et al., 2014) illustrating the significance of the physiological or the ‘felt sense’ (Gendlin, 1996) of illness within the body and patients' perceptions of their illness (Leventhal et al., 1984).

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Social Influences

This theme describes the impact of social influences—cultural, economic, political, social—on patients' decisions to engage in prevention programmes and any subsequent lifestyle changes. One study explicitly drew upon social networks to test different methods of invitation (Harkins et al., 2010): the first was a social media campaign which depended on 'glossy' information leaflets sent to postal addresses requesting that local residents phone the GP surgery to make an appointment; the second a community development project which employed community outreach workers to invite local residents by word of mouth to a drop-in clinic. There was resistance to being accessed by post for a number of reasons (including letters being perceived as junk mail, frequent changes of address, escaping debt or benefit fraud). In contrast, positive responses to face to face interactions with the outreach workers were reported.

Meeting the woman (community outreach worker) she was great, I wouldn't have bothered otherwise. (Respondent 3, Group 2; participant; Harkins et al., 2010, p. 4)

Other ways that social networks influenced patients was in their knowledge of CVD and/or diabetes. Some were influenced by their friends' experience of having diabetes, which to them did not appear to be serious (Eborall, Davies, Kinmouth, Griffin & Lawton, 2007). Among those declining screening in the Ebeltoft project (Nielsen et al., 2009, 2005, 2004) social comparisons provided legitimacy to a fatalist view which justified a passive approach to health.

Several informants gave the example of people who had become ill or died young despite giving up smoking, alcohol or unhealthy food. They told stories about people who had been drinking, smoking and eating whatever they liked and yet enjoyed good health and lived to a ripe old age. Thus, the informants questioned whether too many restrictions

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were a good thing, hinting that they might be unhealthy or spoil one's happiness.

(authors; Nielsen et al., 2004, p.30)

This position relates to beliefs about health but also whether health – or preventative behaviour to reduce risk - is prioritised when set in the context of quality of life. Enjoyment of risky behaviours or the threat to happiness created by knowing one's risk in these cases outweighed the benefits of engaging in a prevention programme. The example described above of the pride associated with good health and the close link between health and ability to work demonstrates how social influences can impact on individuals' decision-making processes and health behaviours (Emmelin et al., 2007). In these cases, public health campaigns must also seek to change perceptions of health if prevention programmes are going to be taken up and make a difference in disease incidence on a national level.

Role and identity

Factors related to social influence, and context, were aspects of role and identity attributed by patients to themselves and healthcare professionals. This theme describes how for some patients identity was a key factor that influenced their readiness to take up a healthier lifestyle. The extract below demonstrates how a person's belief about their quality of life can reflect their identity, in this case as a smoker/ex-smoker, and prevent them from taking preventative action because the costs outweigh the benefits.

My life was better when I smoked, took five minutes off to sit and relax...I couldn't sit still [when I gave up smoking], I couldn't relax enough to drink a cup of coffee with my wife. I've really thought about this a lot; we only live once, I've almost made up my mind that I'm going to take a gamble and smoke rather than torment myself. (J3-14; participant; Nielsen et al., 2005, p. 236)

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For this participant, the sense of wellbeing from engaging in a risky behaviour was perceived as more important than denying such pleasures in order to reduce risk. There was a sense in some accounts that population-level prevention programmes were badly received because they challenged participants' sense of autonomy.

They [participants] stressed the importance of autonomy and the individual's incontestable right to determine his [*sic*] own lifestyle himself [*sic*] and even to enjoy risky habits. (authors; Nielsen et al., 2004, p. 30)

Some expressed trust toward healthcare professionals and readily accepted the need to rely on the healthcare system to identify risk levels because they were unable to measure their own blood pressure, blood glucose or cholesterol (Goyder et al., 2009; Nielsen et al., 2004). Others reacted negatively toward being invited to a prevention programme and receiving reminders if they did not attend. This was coupled with a rebellion against being told what to do by the state.

Receiving more than one invitation made some feel that the authorities were being over-officious. They also underlined the risk of giving people a guilty conscience and the negative effects on one's quality of life. The informants neither wanted nor needed the doctor to ask them to cut down on smoking or lose weight unless they had asked for advice. Telling them to do so might simply irritate them and make them more reluctant to try. (authors; Nielsen et al., 2004, p. 30)

This emphasizes the challenge of getting the balance right between information provision and encouragement to make lifestyle changes and the sensitivities people feel about their health which is bound up with their sense of identity. This means that having one's health criticised may be perceived as an assault on the self. These emotional responses related to the role of the

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healthcare system and the individual in prevention programmes were summarised in one paper which categorised the different positions taken up by participants (Emmelin et al., 2007). Some participants were reported to perceive the programme as a “disappointment” because they felt they did not belong to the risk groups identified which meant their high expectations of the programme were not met. Others felt the programme as an “insult”.

They expressed ambivalence towards the programme even if they may have applauded it at the start. Their participation was more based on feelings than on their own health problems. However, they may have had the targeted risk factors but felt that they could not meet the demands from the programme. They felt criticised and worried over not being able to do something about it. In this group there was also a greater suspicion about the collective ambition of the programme. (authors; Emmelin et al., 2007, p. 9)

The embedded emotion in these reactions implies that prevention programmes were not always evaluated rationally. There was also an underlying sense of moralisation, as demonstrated above with the belief that health is something good, an indicator of citizenship or “civic responsibility” (Burgess et al., 2014, p. 6). This notion of ‘doing good’ was also observed in the perceived role of healthcare professionals who were described or described themselves as educators or facilitators (Goyder et al., 2009).

Context

This final theme brings together the impact of social influences and role and identity to focus on the context of interactions between healthcare professionals and patients within prevention programmes. This includes micro-contextual factors such as whether interactions were face-to-face up to macro-contextual factors such as whether the programme received governmental support. It was clear that patients valued face-to-face interactions or conversations on the

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telephone (Goyder et al., 2009; Harkins et al., 2010; Lanza et al., 2007; Srarancharoenpong & Hanning, 2011; Troughton et al., 2008). This enabled patients to ask questions and gave healthcare professionals the opportunity to explain to patients the process and benefits of knowing their risk level. As stated above, letters and written information were often ignored, negating their utility in this context but there was little imagination about how else to communicate with the public about such programmes and about the risks of CVD and diabetes (Goyder et al., 2009; Harkins et al., 2010; Troughton et al., 2008).

The benefits of face-to-face interactions were also highlighted in the comparison between social media based invitations and community based verbal invitations (Harkins et al., 2010). Setting these conversations in a community context rather than in a healthcare setting was preferable to some because it prevented a feeling of "getting lectured to" (Respondent 3, Williams et al., 2001) with the intention of boosting attendance and breaking down the barrier of asking people to make a special trip to a clinic for the tests. Whether such time intensive resources were available was related to the level of organisational commitment to the programme. In almost all studies there was a clear indication of support both in terms of financial investment and infrastructure. Furthermore, some participants appreciated the community spirit and enjoyed feeling part of something larger (Emmelin et al., 2007; Nielsen et al., 2004; Nielsen et al., 2009). A striking exception to this was the lack of organisational and governmental commitment evident in the Thai study (Srarancharoenpong & Hanning, 2011) which raised significant questions regarding the sustainability of the programme.

The conceptual model

The themes reported above were combined to create a conceptual model of patients' perceptions and experiences of prevention programmes (represented in Figure 2). This conceptual model of prevention programmes brings together what were identified as active

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components in the prevention programmes evaluated in the original studies. Synthesizing this evidence with theoretical constructs from the a priori framework and other health psychology theories cited in the original studies has informed the development of this model particularly with respect to the relationships between the themes generated.

The diagram depicts *social influences* feeding into *knowledge* and *beliefs*. Social influences included social constructions of health in terms of citizenship which influenced patients' sense of identity in relation to judgements about risky behaviours and quality of life. Similarly, some patients' sense of autonomy led them to rebel against a population level prevention programme designed to help them manage their health, because they felt that was their own responsibility. *Knowledge* and *beliefs* were often described as interconnected and sometimes interdependent, hence the two-way arrow. Knowledge can be targeted through educational programmes, but we know that knowledge alone does not predict behaviour. Indeed, most health psychology theories of behaviour—Theory of Planned Behaviour (Ajzen, 1991), Protection Motivation Theory (Rogers, 1983), the Health Action Process Approach (Schwarzer, 1992)—argue that knowledge informs beliefs, which in turn, influence more proximal predictors of behaviour such as self-efficacy and intentions. Furthermore, the synthesis suggested that *beliefs* could manifest as barriers to education confirming that changes in beliefs may be required for prevention programmes to be successful.

On the right hand side of the diagram is *context*. Some patients conceptualized healthcare professionals as educators and associated them with a formal consultation in which information and advice were provided to increase patients' knowledge and understanding of CVD and/or diabetes. Setting the prevention programme within a community context altered the *role* played by community workers or healthcare professionals involved in delivering the intervention; face-to-face contact in a non-health setting deformed the programme and facilitated access.

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Together, *social influences*, *knowledge* and *beliefs*, *context*, and *role and identity* fed into *cues to (in)action*. The nature of participants' beliefs and their level of understanding of risk factors and CVD or diabetes influenced their readiness to act. Likewise, the setting, the role adopted by healthcare professionals, the perceived role of the programme itself, individuals' sense of identity, and societal factors worked together to influence readiness to engage in prevention programmes and associated behaviour change. Each interconnected theme on the right hand side manifested as either a barrier or facilitator of action and competed with the factors on the left to produce a cue to action or inaction. Together, they were all related to social influences, which cuts across the model as a foundational factor. There was limited evidence to suggest prioritisation of any one factor over another which is why they are presented as equivalent in this model. Nevertheless, the evidence suggests that the significance of each factor is not fixed and that different combinations of factors will play out differently on different occasions.

Discussion

The conceptual model generated from themes identified in included studies illustrates the complex interactions at play between the individual and their social context and between healthcare professionals and organisational structures. These complex factors combine to generate a cue to action or inaction. There are number of entry points within this model where healthcare interventions could manipulate factors affecting (in)action. For these entry points to work as active ingredients they need to be targeted within a supportive context, i.e. through government policy and funding at both national and local levels. An initial entry point might be through *knowledge* and information provision. There is an urgent need to move away from written materials and to invest in resources to facilitate face-to-face healthcare professional-patient interactions through *role and identity*. Secondly, a move toward focusing more strongly on smaller communities may work to produce productive *social influences*. Although

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prevention programmes are often delivered at the population level, there is a need to make them more accessible for the local community which may involve taking them out of the healthcare setting and putting them into workplaces or community centres with additional support available by telephone. Indeed, prevention programmes delivered in primary care or in the community may need to be accompanied by large scale public health messages focusing on lifestyle related to specific behaviours that help to reduce CVD and diabetes risk, e.g. stop smoking, eat well, engage in physical activity. There would then be a foundation on which to build better understanding in individual consultations when tests are conducted.

In terms of the content of the programmes evaluated as potential *cues for (in)action*, there was a marked absence of discussion of goals in the included studies; healthcare professionals gave advice about nutrition and physical activity but it was not clear from the way they were reported whether efforts were made to tailor this advice to the individual or indeed to engage in goal-setting. These findings resonate with empirical work published following the completion of this review (Shaw, Pattison, Holland & Cooke, 2015). The lack of tailored advice identified was disappointing because there is evidence to demonstrate that making specific plans to reach a goal is a successful behaviour change technique for promoting adoption of healthy behaviours (Michie et al., 2011; Sniehotta, Scholtz & Schwarzer, 2006).

Furthermore, there is a need to change people's *beliefs* about symptoms in relation to lifestyle related conditions. The absence of symptoms, and feeling well, were common reasons for non-engagement with programmes which justified *inaction* or confirmed participants' perceptions that their current lifestyle did not need to be changed. This link between a 'felt sense' of illness in the body is not included in the TDF but discussed in the original studies with reference to Leventhal et al.'s (1984) Common Sense Model of Illness Representations and physiological factors contributing to self-efficacy (Bandura, 1977). It is clear from these qualitative studies

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that illness perceptions are a significant contributor to *beliefs* which then help to formulate *cues to (in)action*, i.e. whether individuals take up invitations to prevention programmes.

Of course taking action is not only the responsibility of the patient; the behaviour of healthcare professionals is also important and should be considered a proximal determinant for the quality of care that patients receive (French et al., 2012). Thus, in reviewing the effectiveness of interventions, especially in terms of context and acceptability, it is necessary to examine patient *and* healthcare professional perspectives regarding the reception and delivery of interventions, their impact on patients' everyday lives, and the training and support required to enable healthcare professionals to follow protocols faithfully and deliver them competently (Bellg et al., 2004; Shaw et al., 2014). Unfortunately few studies included accounts from healthcare professionals which means there is insufficient evidence on which to draw conclusions about their role in CVD and diabetes prevention programmes.

Finally, these qualitative studies made clear that people's perceptions and reactions to prevention programmes may not always be rational. This highlighted the need to strike a careful balance between information provision and encouragement from healthcare organisations to make lifestyle changes so as not to cause insult or prompt a rebellious denial. Each element of the prevention programme needs to be carefully crafted to ensure it is positively received. The best way to achieve this is to work together with patients and families. Using rigorous qualitative research can be vital in formulating an intervention that will be acceptable and feasible within a specific context (for an example of intervention development using qualitative methods, see: Hudson, Duncan, Pattison & Shaw, 2015).

Strengths and limitations of original studies

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Limitations of original studies included missing details of the behavioural components of interventions and lack of transparency making it difficult to determine which aspects of the interventions were successful. Nevertheless, the transparent reporting of the analysis of primary data in high quality studies meant that data extracts were available providing a greater depth of understanding.

Strengths and limitations of the review

This is the first synthesis of evidence relating to prevention programmes for CVD and diabetes which uses the TDF as an a priori framework. This meant the synthesis was informed both by a range of health psychology theories *and* empirical findings in the included studies. This review is limited by the quality of original studies, though we note that none of the 14 included studies was rated as poor, and it is limited in scope by its question. Furthermore, additional work is required to test the use of the TDF and its coverage; several theoretical constructs in included studies were not represented. This suggests further development of the TDF is required for it to fully serve as an a priori framework that comprehensively represents the breadth of existing health psychology theory. Thus, an update of the systematic review of health psychology theories may be required before the TDF could be packaged alongside 'best fit' framework synthesis as a methodological exemplar for 'policy urgent' systematic reviews in health psychology.

Conclusion

The conceptual model, developed from this synthesis, enhances the emphasis on the complex interactions between individuals' beliefs, knowledge and identity, their social networks, wider societal constructions of health, and organisational factors. At the centre of the model are the *cues to (in)action* which are created through different combinations of factors. More research is needed to make explicit the behavioural components of prevention programmes which focus on

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patients' and also healthcare professionals' perceptions and experiences to discern which behavioural elements are active in which contexts. Furthermore, programmes for the identification of risk and prevention of CVD and diabetes need to take account of the person-in-context and therefore of the individual within the system. Thus, healthcare providers need to take seriously patients' health beliefs and the context in which programmes operate when identifying intervention points. Public health campaigns to improve knowledge and change beliefs and behaviour need to be combined with practical steps to facilitate equivalent access across socio-demographic boundaries.

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Table 1: Details of original studies

Paper	Quality rating	Author & date	Research question/aims	Sampling method n=	Intervention	Location	Data collection method	Data analysis method
P1	KP^	Burgess (2014)	To explore patterns of uptake; influences on decision to attend screening	Patients Purposive n=27	NHS Health Check	UK	Interviews	Framework analysis
P2	SAT	Chipchase (2013)	To explore impact of NHS Health Check with patients	Patients Random n=10	NHS Health Check	UK	Interviews	Interpretative phenomenological analysis
P3	KP	Eborall (2007)	To provide insight into factors contributing to anxiety; to explore expectations & reactions to screening experience	Patients HCPs Purposive n=23	ADDITION trial Type 2 diabetes screening	UK	Interviews	Grounded theory
P4	KP	Emmelin (2007) °	To describe changes in self-rated health related to risk factors; to describe health	Patients Purposive n=9	Cardiovascular risk factors screening	Sweden	Interviews	Grounded theory

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			related norms & attitudes toward CVD programme					
P5	KP	Goyder (2009)	To examine perceptions of staff & patients involved in screening	Patients Purposive n=49 HCPs n= 23	Diabetes screening	UK	Interviews	Framework analysis
P6	KP	Harkins (2010)	To explore perceived barriers & facilitators to engaging in CHD primary prevention programme	Patients n=13	CHD prevention programme	UK	Focus groups	Thematic analysis
P7	UNS	Lanza (2007) °	To evaluate the Diabetes Detection Initiative	Patients Purposive n=20-32*	Diabetes Detection Initiative	US	Discussion groups	Not stated
P8	SAT	Nielsen (2009) \$	To explore individuals' responses to a low cardiovascular risk score	Patients Purposive n=22	Ebeltoft Project CVD	Denmark	Interviews	Thematic analysis using Malterud's principles

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P9	KP	Nielsen (2005) \$	To explore individuals' responses to an elevated cardiovascular risk score	Patients Stratified purposive n=14	Ebeltoft Project CVD	Denmark	Interviews	Thematic analysis using Malterud's principles
P10	SAT	Nielsen (2004) \$	To explore non-participants' views on invitations to health screenings	Patients Stratified purposive n=47	Ebeltoft Project CVD	Denmark	Interviews	Thematic analysis using Malterud's principles
P11	SAT	Ray (2001)	To explore behavioural changes of those attending screening	Patients Self-selected n=135	Heart risk screening	Australia	Telephone interviews	Content analysis
P12	KP	Sranacharoenpong (2011)	To investigate barriers to & support for community-based diabetes prevention programme	Patients HCPs Purposive n=43	Diabetes prevention programme	Thailand	Interviews and focus groups	Thematic analysis
P13	KP	Troughton (2008)	To ascertain individuals' experience of screening	Patients HCPs	Pre-diabetes	UK	Interviews	Framework analysis

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				Purposive n=15				
P14	UNS	Williams (2001) °	To examine the impact of a culturally appropriate recruitment strategy to CVD screening	Patients in work context n=66	Healthier People Risk Appraisal CVD	US	Interviews	Not stated
<p>^ KP: Key paper – meets all quality criteria and clearly fits with review question; SAT: satisfactory – meets most quality criteria and fits well to review question; UNS: unsure – mixed responses to quality criteria and lack of clarity regarding relevance to review question; P: poor – does not meet quality criteria ° Mixed methods study – only the qualitative elements of these studies were included in this review * Exact sample size of qualitative element not stated \$ These studies report results from the same study</p>								

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Table 2: Appraisal of original studies

Prompt	R*	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
1. Are the research questions clear?	1	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
	2	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
2. Are the research questions suited to qualitative inquiry?	1	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
	2	Y	-	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
3. Is the sampling clearly described?	1	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
	2	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	N
4. Is the data collection clearly described?	1	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5. Is the analysis clearly described?	1	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
	2	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y

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6. Is the sampling appropriate to the research question?	1	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y
	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-
7. Is the data collection appropriate to the research question?	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8. Is the analysis appropriate to the research question?	1	Y	Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	-
	2	Y	Y	Y	Y	Y	Y	-	-	-	-	Y	Y	Y	Y
9. Are the claims made supported by sufficient evidence?	1	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N
	2	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N
10. Are the data, interpretations, and	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N

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conclusions clearly integrated?															
11. Does the paper make a useful contribution?	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Overall rating (KP, SAT, UNS, P) °	1	KP	SAT	KP	KP	SAT	KP	UNS	SAT	KP	SAT	SAT	KP	KP	SAT
	2	KP	SAT	KP	KP	KP	KP	UNS	SAT	SAT	SAT	KP	KP	KP	P
Agreed rating		KP	SAT	KP	KP	KP	KP	UNS	SAT	KP	SAT	SAT	KP	KP	UNS
* Reviewer° KP: Key paper – meets all quality criteria and clearly fits with review question; SAT: satisfactory – meets most quality criteria and fits well to review question; UNS: unsure – mixed responses to quality criteria and lack of clarity regarding relevance to review question; P: poor – does not meet quality criteria															

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Table 3: Coding of included studies against the a priori framework: the Theoretical Domains Framework

	DOMAINS and Constructs*	Studies coded to this Domain	Analytic observations
D1	KNOWLEDGE Knowledge; procedural knowledge; knowledge of task environment	P1,2,3,4,5,6,7,8,10,11,12,13,14 k=13	Generally knowledge is poor If knowledge is good it doesn't always lead to behaviour change – it interacts with other mediating factors
D2	SKILLS Skills; skills development; competence; ability; interpersonal skills; practice; skill assessment	P2,3,12 k=3	Healthcare professionals need to be trained & supported
D3	SOCIAL/PROFESSIONAL ROLE AND IDENTITY Professional identity; professional role; social identity; identity; professional boundaries; professional confidence; group identity; leadership; organisational commitment	P3,4,9,10,12,13,14 k=7	Identity in relation to individuals & organisations are mediating factors

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D4	BELIEFS ABOUT CAPABILITIES Self-confidence; perceived competence; self-efficacy; perceived behavioural control; beliefs; self-esteem; empowerment; professional confidence	P4,8,10,11,12,13 k=6	A mixture of terms are used including: self-efficacy, perceived behavioural control, confidence
D5	OPTIMISM Optimism; pessimism; unrealistic optimism; identity	P1,3,9,13 k=4	Sometimes unrealistic optimism linked to inaction
D6	BELIEFS ABOUT CONSEQUENCES Beliefs; outcome expectancies; characteristics of outcome expectancies; anticipated regret; consequents	P1,2,3,4,5,8,10,13 k=8	Expectations of results influence decision-making
D7	REINFORCEMENT Rewards; incentives; punishment; consequents; reinforcement; contingences; sanctions	P4,8,11,13 k=4	Confirmation of (good) health status
D8	INTENTIONS Stability of intentions; stages of change model; transtheoretical change model and stages of change	P4,8,9,10,11,13 k=6	Talk of changes included but in no detail
D9	GOALS	P4,9,11 k=3	Talk of changes made but not in language of behaviour change techniques

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	Goals; goal priority; goal/target setting; goals (autonomous/controlled); action planning; implementation intention		
D10	MEMORY, ATTENTION AND DECISION PROCESSES Memory; attention; attention control; decision making; cognitive overload/tiredness	P5,8 k=2	Decision-making
D11	ENVIRONMENTAL CONTEXT AND RESOURCES Environmental stressors; resources/material resources; organisational culture/climate; salient events/critical incidents; person x environment interaction; barriers and facilitators	P1,2,3,4,5,6,9,10,11,12,13,14 k=13	Materials & resources; person x organisation interaction includes patient x healthcare professional interaction
D12	SOCIAL INFLUENCES Social pressure; social norms; group conformity; social comparisons; group norms; social support;	P2,3,4,5,6,7,8,9,10,11,13 k=11	Community/collective effort; social pressures; power issues relating to doctor-patient relationship

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	power; intergroup conflict; alienation; group identity; modelling		
D13	EMOTION Fear; anxiety; affect; stress; depression; positive/negative affect; burn-out	P4,5,6,8,9,10,11 k=7	Positive/negative affect; some anxiety
D14	BEHAVIOURAL REGULATION Self-monitoring; breaking habit; action planning	P11 k=1	Self-reported changes

* All definitions are based on definitions from the American Psychological Association's Dictionary of Psychology; adapted from Cane et al. (2012).

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Table 4: Inductive thematic analysis of included studies: concepts not included in the TDF

	Themes	Studies coded to these themes	Analytic observations
T1	Perceived/experienced symptoms	P1,3,6,10,13 k=5	Cited reason for not screening/not taking action (T4)
T2	Prioritisation of health/behaviour change in relation to quality of life	P2,9,12 k=3	Cited reason for not taking action (T4)
T3	Reassurance/confirmation of (good) health status	P1,2,4,8,13 k=5	Knowledge of risk factors & relationship of lifestyle on CVD mediate this confirmation of good health (D1); relates to beliefs/expectations of consequences (D6)
T4	Cue to (in)action	P3,4,9,10 k=4	Either prompts action or not depending on interaction with T1,2,9; related to D7,13
T5	Moralising health	P3,4,8 k=3	Good health perceived to equate to good person; relates to social influences (D12)

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T6	Mind-body/whole person approach to health	P4,10 k=2	Physical symptoms not experienced is perceived to equate to absence of illness; relates to D1
T7	(in)dependence from/on healthcare services	P8,10,13 k=3	Caution against passivity/dependence on healthcare system; individual choice
T8	Rebellion against public health strategies/authority/community approach	P6,10 k=2	Related to moralising health – reaction against notion of common good/authority
T9	Perceived good health/lack of symptoms	P2,6,10,11 k=4	Cited reason for inaction (T4)
T10	Longevity of risk factors/illness	P10 k=1	Related to knowledge of risk factors over time (T1)
T11	Perceived professional role and identity	P3,4,9,10,12,13,14 k=7	Related to professional role and identity (D3) but focuses on patients' perceptions of professionals